

WHAT IS CLAIMED IS:

1. A dielectric recording / reproducing head for a dielectric recording medium, comprising a recording / reproducing electrode for recording information or data in the dielectric recording medium or reproducing information or data recorded in the dielectric recording medium, wherein a first width of a tip portion of the recording / reproducing electrode is larger than a width of a track of the dielectric recording medium.

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2. The dielectric recording / reproducing head according to claim 1, wherein the tip portion of the recording / reproducing electrode has the first width in a longitudinal direction and a second width in a cross direction, and the first width is larger than the second width.

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3. The dielectric recording / reproducing head according to claim 1, wherein the shape of the cross-section of the tip portion of the recording / reproducing electrode is an ellipse or rectangle.

20 4. A dielectric recording / reproducing head for a dielectric recording medium, comprising:

a recording / reproducing electrode for recording information or data in the dielectric recording medium or reproducing information or data recorded in the dielectric recording medium; and

25 a slider placed on the surrounding of the recording / reproducing electrode and having a surface facing to the dielectric

recording medium.

5. The dielectric recording / reproducing head according to claim 4, wherein the recording / reproducing electrode has a cantilever 5 shape.

6. The dielectric recording / reproducing head according to claim 4, wherein the slider contains a conductive member and has a function of a return electrode for returning an electric field applied 10 from the recording / reproducing electrode to the dielectric recording medium.

7. The dielectric recording / reproducing head according to claim 4, wherein

15 the slider contains an insulating member and has a conductive film on the surface of the slider facing to the dielectric recording medium, and

the conductive film has a function of a return electrode for returning an electric field applied from the recording / reproducing 20 electrode to the dielectric recording medium.

8. The dielectric recording / reproducing head according to claim 4, wherein an end portion of the slider located against a direction in which the dielectric recording medium relatively moves has a curved 25 or sloping surface with respect to a surface of the dielectric recording medium.

9. The dielectric recording / reproducing head according to claim 4, wherein a tip portion of the recording / reproducing electrode is located not to project from the surface of the slider facing to the dielectric recording medium.

10. The dielectric recording / reproducing head according to claim 4, wherein a first width of a tip portion of the recording / reproducing electrode is larger than a width of a track of the dielectric recording medium.

11. The dielectric recording / reproducing head according to claim 10, wherein the tip portion of the recording / reproducing electrode has the first width in a longitudinal direction and a second width in a cross direction, and the first width is larger than the second width.

12. The dielectric recording / reproducing head according to claim 10, wherein the shape of the cross-section of the tip portion of the recording / reproducing electrode is an ellipse or rectangle.

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13. The dielectric recording / reproducing head according to claim 4, comprising a first tracking signal detection electrode for detecting a tracking signal.

25 14. The dielectric recording / reproducing head according to claim 13, wherein the first tracking signal detection electrode is placed in

front of or behind the recording / reproducing electrode, deviating by half a track pitch in one direction along a track width direction.

15. The dielectric recording / reproducing head according to claim
5 14, comprising a second tracking signal detection electrode for detecting a tracking signal, wherein the second tracking signal detection electrode is placed in front of or behind the recording / reproducing electrode, deviating by half a track pitch in the opposite direction to said one direction.

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16. The dielectric recording / reproducing head according to claim 4, wherein an insulator is placed between the slider and the recording / reproducing electrode.

15 17. The dielectric recording / reproducing head according to claim 16, wherein the recording / reproducing electrode is held by the insulator in the inside of the slider, so that the position of the recording / reproducing electrode is fixed.

20 18. The dielectric recording / reproducing head according to claim 17, wherein the insulator is a molding member for holding the recording / reproducing electrode in the inside of the slider.

19. A tracking method of a dielectric recording / reproducing head
25 for a dielectric recording medium having tracks, comprising the processes of:

obtaining a tracking error signal from adjacent two tracks by using a recording / reproducing electrode whose tip portion has a width larger than a width of the track; and

5 performing tracking control on the basis of the obtained tracking error signal.

20. The tracking method according to claim 19, wherein a plurality of first pits each having a first polarity and a plurality of second pits each having a second polarity are alternately arranged on 10 each of the adjacent two tracks, and a location of an arrangement of the plurality of first pits and the plurality of second pits on one of the adjacent two track and a location of an arrangement of the plurality of first pits and the plurality of second pits on the other of the adjacent two tracks are shifted each other at an angle of 90 degrees.

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21. The tracking method according to claim 20, wherein the plurality of first pits and the plurality of second pits are recorded on the adjacent two tracks as polarization directions of a ferroelectric material of the dielectric recording medium.

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22. The tracking method according to claim 19, wherein the tracking error signal is obtained by using a scanning nonlinear dielectric microscopy.

25 23. A tracking method of a dielectric recording / reproducing head for a dielectric recording medium having tracks, comprising the

processes of:

obtaining a tracking error signal from adjacent two tracks by using a tracking signal detection electrode which is located on or above the adjacent two tracks; and

5 performing tracking control on the basis of the obtained tracking error signal.

24. A tracking method of a dielectric recording / reproducing head for a dielectric recording medium having tracks, comprising the

10 processes of:

obtaining a tracking error signal from a target track, a first adjacent track located on one side of the target track and a second adjacent track located on the opposite side of the target track by using a first tracking signal detection electrode located on or above the target track and the first adjacent track and a second tracking signal detection electrode located on or above the target track and the second adjacent track; and

15 performing tracking control on the basis of the obtained tracking error signal.